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2 December 1982

MEMORANDUM FOR: Chief, Resource and Technology Center

FROM: Chief, Resources Branch

SUBJECT: Wang Exploitation

Introduction

The purpose of this memorandum is to report on and expand our 27 September plan for evaluating the Wang Office Automation System. In it we describe and assess the first phase of our plan, now complete, then present and comment on the four remaining phases. The ASG Applications Center is evaluating the Wang as a microcomputer system and will issue a report in April 1983.

Phase I

The first phase of our Wang testing was to include the following:

- Acquire and install a Wang Office Information System (the Alliance 250) in the Analytic Support Group (ASG).
- Train personnel who will be participating in the Wang evaluation.
- Assess the environmental impact of the Wang.

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The results of the first-phase tests are as follow:

Installation

An Alliance system was installed in 2G40 Headquarters on 17 November 1982. It included 12 terminals and 4 printers. The installation period covered about two weeks, during which time the office was seriously disrupted by the presence of several workers who installed the cables. The job was a messy one, lending further to the disruption.

Over three months elapsed between the time we submitted our order to the Office of Data Processing (ODP) and the operational date. ODP tells us that is the average time required. This compares with an average procurement/installation time of 30 days for NBI word processing systems.

As our Alliance was being installed, we learned several things about it that we hadn't know before:

- Terminal Separation. ODP told us that we could place terminals up to 1000 feet from the central processor unit (CPU). We later were told that the maximum separation was 500 feet, not 1000 feet. This matter could be very important to the DI if we begin installing Alliance systems in the many DI offices that are spread through several floors and at various corners of the building. ODP tells us they are working on a means of extending the maximum separation up to 1000 feet and should be successful about mid-1983.
- Alliance Capacity. We were told that our Alliance could accommodate up to 32 devices (24 terminals and 8 printers). During installation, we found that the system will support only 28. It seems two of the available connections are reserved for telecommunications interfaces (links to VM or other Alliances, for example), and two are reserved for software packages (like the CP/M package we are ordering for the Applications Center).
- System Terminal. One terminal must eventually be installed immediately adjacent to the CPU and disk drives. During maintenance and service operations--such as filing and system updates--the system administrator must monitor activities on both the CPU and a terminal.

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- VM Interface. The VM to Wang interface is under development, but it may take longer than anticipated. Initially, personnel will only be able to "dump" files into the VM system. ODP is currently engaged in an intensive upgrade effort to allow data to be passed from a Wang network to the P&PD ETEC System. We anticipate that only one or two ASG Wang system users will be able to interface with the VM system at a time. The remainder must wait until one of the other users has completed his work session.
- Cost. The attached cost comparison suggests the Wang might be more cost effective for systems with seven or more workstations, but less cost effective for systems with six or fewer workstations.

Training

Each Alliance requires a system administrator. System administrator training consists of 6 1/2 working days. The system administrator's job could well become a full-time position for most DI offices. We estimate that it will take approximately six months for the systems administrator to become comfortable with the system.

Environmental Impact

Now that we have an Alliance in our office we can comment on several environmental issues.

- Space. The CPU and disk drives require approximately 100 square feet of space.
- Noise. The CPU and disk drives are too noisy for most office environments, so they require an isolated area.
- Heat. The system cannot function in areas whose temperature is above 90 degrees, therefore may require supplemental cooling.

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Phase II

The second phase of testing, now underway, is scheduled to be completed by 31 December 1982. It addresses the question of whether the Wang is an adequate replacement for the NBI as a word processor and focuses on the following:

- Basic system features.
- Keyboard configuration and comfort.
- Screen size.
- Printer speed and capability.

The second-phase testing will include the following:

- A comparison of the Wang and NBI basic word processing capabilities by the ASG. Kathy Huntley of the RTC will do most of this evaluation and will concentrate on the basic features common to both systems. Certain features of the Wang, characterized as advanced features and requiring advanced training, will not be tested. These features include word-in-text indexing, programming, and dictionary building.
- A comparison of the Wang and NBI systems by representatives from nine DDI offices (CPAS, SOVA, OEA, EURA, NESA, OGI, CRES, OSWR, and OCR). The representatives completed two days of word processing training in November. They will bring office typing material, normally prepared on NBIs, to the ASG and prepare the material on the Wang. Participants will be asked to complete questionnaires on all aspects of the system as they do their typing. We expect each representative to spend several hours per week on the Wang.
- A detailed cost comparison between the Wang and the NBI.
- Several other offices are evaluating Wang systems, including ODP, DCD, OCR, and OSWR. We will solicit information from them as part of our evaluation.

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Preliminary results of our second-phase testing are as follow:

- Word processing functions require more key strokes on the Wang than on the NBI.
- Text disappears from the Wang screen when change or insert commands are used.
- Formatting requires more keystrokes on the Wang than on the NBI.
- Sheet feeders are not available for the Wang. Continuous feed paper is not an adequate substitute.

Phases III-V

Assuming the Wang is found to be an adequate replacement for the NBI for basic word processing, we will test additional Wang features as follows:

- Phase III. Evaluate advanced word processing and office automation features, including calendar, notebook, visual memory, advanced data manipulation features, and personal message exchange.
- Phase IV. Add terminals and printers to our system and evaluate its ability to respond when fully loaded.
- Phase V. Evaluate the system's ability to provide easy access to the VM and SAFE systems, and the adequacy of the Wang terminal as a VM and SAFE terminal.



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60 MONTH COST COMPARISON PER WORKSTATION WANG VS NBI

#WS	WANG ALLIANCE	WANG 7525	WANG 7520	SINGLE NBI 3000	DUAL NBI 3000
1	1294.12	620.80	330.64	459.66	286.33
2	693.76	357.13	212.00		
3	493.65	268.77			
4	303.56	225.29			
5	361.90	227.25			
6	317.16	204.94			
7	285.20				
8	261.23				
9	258.32				
10	241.87				
11	228.34				
12	217.10				
13	218.48				
14	209.55				
15	201.81				
16	195.04				
17	197.04				
18	191.62				
19	190.74				
20	181.80				
21	184.50				
22	180.21				
23	176.44				
24	172.98				

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. ASSUMPTIONS:

. WANG: 1. All equipment quoted is TEMPEST.

. 2. Maintenance prizes are included and

. reflect 5% increase compounded yearly.

. 3. All systems include 1 printer per 4

. workstations, (minimum of 1 per system)

. two 80mb disk drives for Alliance

. 4. Prices are based on 24 month

. purchase with maintenance for 60 months

. 5. Includes the following SOFTWARE:

. Wordprocessing and Advanced Functions

. Dictionary

. Glossary and Decision Processing

. Math/Sort

. Word Search

. Message

. Visual Memory

. Calendar

. Telephone Directory

. BASIC

. Telecommunications

. CP/M (\$850.00 chargeable)

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. NBI: 1. NON TEMPEST

. 2. All systems are dual disk with one

. printer per system.

. 3. Wordprocessing software only no

. optional software included.

. 4. No price increase in maintenance

. were included (current price used)

. 5. Prices based on 24 month lease

. purchase with 50% rental credit

. applied plus maintenance for 36

. additional months.

COST TABLE FOR WANG SYSTEMS

	<u>7520</u>					
# WORKSTATIONS/PRINTERS	<u>1/1</u>	<u>2/1</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
Purchase	8873.00	11603.00				
Monthly Lease	435.00	570.00				
Monthly Maint	141.75	177.45				
Total Monthly System Cost	576.75	747.45				
Monthly Cost per Terminal	576.75	374.00				

	<u>7525</u>							
WORKSTATIONS/PRINTERS	<u>1/1</u>	<u>2/1</u>	<u>3/1</u>	<u>4/1</u>	<u>5/2</u>	<u>6/2</u>	<u>7/2</u>	<u>8/2</u>
Purchase	12968.00	15698.00	18428.00	21158.00	27563.00	30293.00		
Monthly Lease	637.00	772.00	907.00	1042.00	1357.00	1492.00		
Monthly Maint	331.20	366.90	402.60	438.30	537.00	572.70		
Total Monthly System Cost	968.20	1138.90	1309.60	1480.60	1894.00	2064.70		
Monthly Cost per Terminal	968.20	569.45	437.53	370.00	378.80	344.11		

COST TABLE FOR WANG SYSTEMS

7550 ALLIANCE								
# WORKSTATIONS/PRINTERS	<u>1/1</u>	<u>2/1</u>	<u>3/1</u>	<u>4/1</u>	<u>5/2</u>	<u>6/2</u>	<u>7/2</u>	<u>8/2</u>
Purchase	28455.00	31185.00	33915.00	36645.00	43050.00	45780.00	48510.00	51240.00
Monthly Lease	1396.00	1531.00	1666.00	1801.00	2116.00	2251.00	2386.00	2521.00
Monthly Maint	665.75	701.40	737.10	772.80	871.50	907.20	942.90	978.60
Total Monthly System Cost	2061.75	2232.40	2403.10	2573.80	2987.50	3158.20	3328.90	3499.60
Monthly Cost per Terminal	2061.75	1116.20	801.03	643.45	597.50	526.36	475.55	437.45
# WORKSTATIONS/PRINTERS	<u>9/3</u>	<u>10/3</u>	<u>11/3</u>	<u>12/3</u>	<u>13/4</u>	<u>14/4</u>	<u>15/4</u>	<u>16/4</u>
Purchase	57645.00	60375.00	63105.00	65835.00	72240.00	74970.00	77700.00	80430.00
Monthly Lease	2836.00	2971.00	3106.00	3241.00	3556.00	3691.00	3826.00	3961.00
Monthly Maint	1077.30	1113.00	1148.70	1184.40	1283.10	1318.80	1354.50	1390.20
Total Monthly System Cost	3913.30	4084.00	4254.70	4425.40	4839.10	5009.80	5180.50	5351.20
Monthly Cost per Terminal	434.81	408.40	386.79	368.78	372.23	357.84	345.36	334.45
# WORKSTATIONS/PRINTERS	<u>17/5</u>	<u>18/5</u>	<u>19/5</u>	<u>20/5</u>	<u>21/6</u>	<u>22/6</u>	<u>23/6</u>	<u>24/6</u>
Purchase	86835.00	89565.00	92295.00	95025.00	101430.00	104160.00	106890.00	109620.00
Monthly Lease	4276.00	4411.00	4546.00	4681.00	4996.00	5131.00	5266.00	5401.00
Monthly Maint	1488.90	1524.60	1560.30	1596.00	1694.70	1730.40	1766.10	1801.80
Total Monthly System Cost	5764.90	5935.60	6106.30	6277.00	6690.70	6861.40	7032.10	7202.80
Monthly Cost per Terminal	339.11	329.75	321.38	313.85	318.60	311.88	305.74	300.11

ASSUMPTIONS:

1. ALL EQUIPMENT QUOTED IS TEMPEST
2. Calculations are based on FY 1983 prices
3. 24 Month Lease with ownership at completion of 24th month.
4. Cost after initial 24 month lease will be maintenance cost only.
5. (1) printer per (4) workstations with at least (1) printer per system
6. Alliance systems have (2) 80mb disk drives.
7. All workstations and printers for 7525 and Alliance 7550 are 64k devices
8. The following software is included at no cost:
 - A) Word processing
 - B) Calander
 - C) Message
 - D) Visual Memory
 - F) Basic
 - G) Telephone Directory
 - H) Glossary
 - I) CP/M (\$850.00 chargeable)
 - J) Multiplan (\$255.00 chargeable)

	<u>TWIN SHEET</u> <u>FEEDER</u>	<u>COMMUNICATIONS</u> <u>CONTROLLER</u>	<u>ADDITIONAL</u> <u>PRINTER</u>	<u>ARCHIVING</u> <u>WORKSTATION</u>
Purchase	1575.00	1050.00	3675.00	6672.00
Monthly Lease	77.00	51.00	180.00	350.00
Monthly Maint	30.45	33.60	63.00	60.00
Total Monthly Cost	107.45	84.60	243.00	410.00
Monthly Cost per Terminal	107.45 % X	84.60 % X	243.00 % X	410.00 % X